# RESEARCH ON BEHAVIOR OF SUNFLOWER HYBRIDS TO CREATE NEW COMPANY LIMAGRAIN UNDER THE INFLUENCE OF CHEMICAL AND FOLIAR FERTILIZATION IN CONDITIONS OF TIMISOARA

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***Abstract:*** *The correct application of any specific technological links sunflower crop, agriculture becomes more sustainable and performance. As with any crop plant, the company achieved spectacular progress Limagrain in Romania in recent years require further research on the main features of type sunflower hybrids Clearfield, their behavior under the influence of differentiated chemicals and foliar fertilization, with further implications on production and morphological features of the achenes. Sunflower hybrids with genetic resistance to certain herbicides imidazolină or sulfuran-urea type that can be applied postemergent contributes well as increasing yields per hectare and the efficiency of sunflower crop in the farms. Bifactorial type experience in the experimental field was located in USAMVB Timişoara. The study took three sunflower hybrids: Rimisol (approved for cultivation in Romania in 2004), F 30008 and Hidalgo, tested against four agro-backgrounds: N0P0K0, N60P60K60, N90P60K60 and N60P60K60 + foliar fertilizer (Fertitel) . In the present paper ther are highlighted aspects of the importance of the Clearfield sunflower hybrids (resistant to the herbicides of the imidazolinones group ) in Romania, the role of the chemical and foliar fertilizers on the sunflower plant growth and development with subsequent implications on production and morphological features achenes, optimal doses of fertilizers with nitrogen, phosphorus and potassium for the pedoclimatic conditions of Timisoara. When applying a foliar vegetation agro-background N60 P60 K60, achieved production of 4602 kg / ha with 263 kg / ha more than the output produced agro unfertilized. Increased production from agro control is provided as very significant. Balanced fertilization with NPK and foliar fertilization applied agro-background N60 P60 K60 positively influence the formation of achenes thereby achieving average yields as highly significant statistically. Physical traits MMB and MH are less influenced by different culture conditions and are quite high for the year what climatic conditions argue that hybrids have a high degree of adaptation to conditions less favorable for sunflowers. Analyzing the three hybrids tested MMB to highlight the fact that fertilization stimulates foliar chemical and mass value of 1000 grains, leading to its growth.*

***Key words:*** *sunflower hybrids, hectoliter weight, 1000 grainsweight, yield*

## INTRODUCTION

Sunflower is one of the most important crop plants in Romania, with regard to surface area it occupies third place after maize and wheat.

In the present study are highlighted aspects of the importance of sunflower hybrids Clearfield type (resistant to herbicides of Group imidazolinonelor) in Romania, the role of foliar fertilizers and plant growth and development of sunflower with subsequent implications on production and morphological features achenes, optimal doses of fertilizers with nitrogen, phosphorus and potassium soil and climate conditions of Timisoara.

The research topic chosen, sunflower hybrids are tested against four agrofonduri: N0P0K0, N60P60K60, N90P60K60 and N60P60K60 + foliar fertilizer - Fertitel. Introducing the culture of type Clearfield hybrids have economic importance for agriculture whereas

monocotyledonous and dicotyledonous weeds using herbicides containing the active substance imidazolinele, mechanical works are eliminated 1-2.

Even if a single year, the results are particularly valuable for practice and underline the effectiveness of agricultural chemicals and foliar fertilization on yield components.

## MATERIAL AND METHODS

Bifactorial type experience in the experimental field was located within USAMVBT on a chernozem soil type drafts, wet groundwater (low gleyed) decarbonated weak, loess, clay argilo-prăfos/luto-argilos, chemical traits with values indicating a potential middle ground with fertility.

Experimental variants were located after three repetitions randomized block method. Fertilization was done by using complex fertilizers 15:15:15 type, applied at seedbed preparation for agrofondurile N60P60K60, K60 + N60P60 N90P60K60 and foliar fertilizer - Fertitel. For agro N90P60K60, supplementing nitrogen level of 90 kg / ha active substance was made by the administration before the first weeding of 50 kg / ha active ingredient, ammonium nitrate.

The study took three sunflower hybrids with resistance to herbicides imidazoline type created by the company Limagrain: Rimisol (approved for cultivation in Romania in 2004), F 30008 and Hidalgo. The research topic chosen, the hybrids mentioned are tested against four agrofonduri: N0P0K0, N60P60K60, N90P60K60 and N60P60K60 + foliar fertilizer (Fertitel).

## RESULTS AND DISCUSSIONS

The analysis results presented in Table 1 shows that, taking sunflower hybrids in the study, conducted in 2008 average production between 4394 and 4662 kg / ha.

If we analyze the interaction yields obtained in experimental factors we find that the highest production is done on the agro N60P60K60 hybrids F 30008 (4827 kg / ha) and Rimisol (4651 kg / ha).

*Table 1*

The achieved yield of three sunflower hybrids under influence of fertilization at S.D.E Timişoara in the experimental year 2008

| Factor B (The hybrid) | Factor A – The agro-background | | | | Means of the factor B | | | |
|---|---|---|---|---|---|---|---|---|
| | Unfertilized | N60K60P60 | N90P60K60 | N60P60K60 + Foliar fertilizer | Mean yield (kg/ha) | Relative yield (%) | Difference ± related to control (MT) | Significatio n |
| Rimisol | 4344 | 4651 | 4608 | 4649 | 4563 | 100 | - | |
| F 30008 | 4495 | 4827 | 4638 | 4686 | 4662 | 102 | 99 | |
| LHA 6654 | 4188 | 4466 | 4453 | 4470 | 4394 | 96 | -169 | |

DL 5% = 193 kg/ha, DL 1% = 257 kg/ha, DL 0,1 % = 338 kg/ha

| Means of the factor A | | | | |
|---|---|---|---|---|
| Mean yield (kg/ha) | 4342 | 4648 | 4566 | 4602 |
| Relative yield (%) | 100 | 107 | 105 | 106 |
| Difference ± related to control (MT) | - | 306 | 224 | 263 |
| Signification | - | *** | *** | *** |

DL 5% = 111 kg/ha DL 1% = 148 kg/ha DL 0,1% = 195 kg/ha

Under the influence of fertilization, sunflower yields increased in all three hybrids studied. Thus to control agro balanced fertilization on the agro fertilized at 60 kg / ha of

nitrogen, phosphorus and potassium, increase production by 306 kg / ha, production growth that is statistically very significant.

When applying foliar vegetation peun agrofond N60P60K60, achieved production of 4602 kg / ha with 263 kg / ha more than the output produced agro unfertilized. Increased production from agro control is provided as very significant.

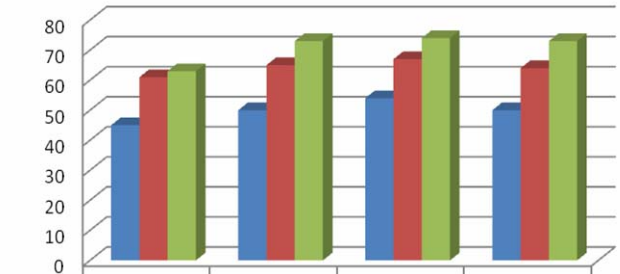



Fig. 1. The influence of the agro-background on achene production in the studied sunflower hybrids within the pedoclimatic conditions of Timişoara

The analysis results presented in table 2 shows that the climatic conditions since the experimental 2008 F 30 008 hybrid achieved a mean weight of 64 grams 1000 beans with 28% more than was achieved in hybrid Rimisol control, growth of 14 g that is statistically very significant. Hidalgo hybrid achieved a mean weight of 71 grams 1000 beans with 42% more than was achieved in hybrid control Rimisol, 21 g increase was statistically significant as a pit.

*Table 2*

Weight of 1000 grains for three hybrid sunflower under the influence of fertilization at S.D.E Timisoara in the experimental year 2008

| Factor B (The hybrid) | Factor A – The agro-background | | | | Means of the factor B | | | |
|---|---|---|---|---|---|---|---|---|
| | Unfertilized | N60K60 P60 | N90P60K60 | N60P60K60+ Foliar fertilizer | Mean value (g) | Relative yield (%) | Difference ± related to control (MT) | Signification |
| Rimisol | 45 | 50 | 54 | 50 | 50 | 100 | - | |
| F 30008 | 61 | 65 | 67 | 64 | 64 | 128 | 14 | *** |
| LHA 6654 | 63 | 73 | 74 | 73 | 71 | 142 | 21 | *** |

DL 5% = 6 kg/ha, DL 1% = 9 kg/ha, DL 0,1 % = 11 kg/ha

| Means of the factor A | | | | |
|---|---|---|---|---|
| Mean value (g) | 56 | 63 | 63 | 62 |
| Relative yield (%) | 100 | 113 | 113 | 111 |
| Difference ± related to control (MT) | - | 7 | 7 | 6 |
| Signification | | *** | *** | ** |

DL 5% = 4 kg/ha, DL 1% = 5 kg/ha, DL 0,1% = 7 kg/ha

Regarding agro shows that the highest average 1000 grain weight (63 g) is obtained on the agro N60 P60 K60, N90 P60 K60 respectively. Growth rate of 7 g achieved with mass of 1000 seeds carried on the agro unfertilized control is provided as a very significant statistically.

In the figure 2 it can be clearly observed the dependence of the studied sunflower hybrids upon the agro-background. The analysis finds hybrids to be the special value of the hybrid Hidalgo at which the highest value of mass 1000 seeds in the three agro-backgrounds.

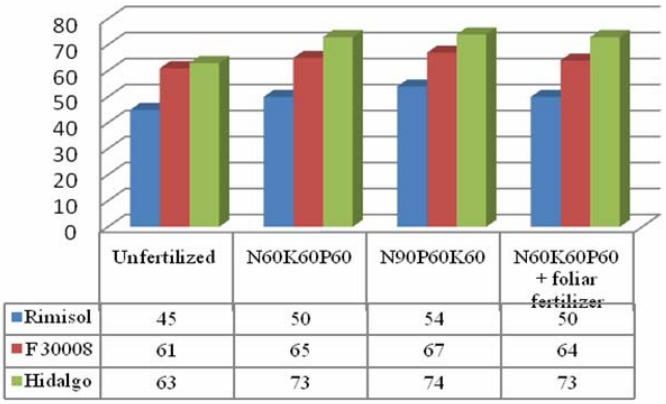



Fig. 2. The mean values of the 1000 grains weight in three sunflower hybrids under fertilization influence in Timişoara, 2008

The data presented in table 3, that Hidalgo and F 30008 hybrids have achieved hectolitre mass averages of 41 and 40 kg / hl, compared to only 37 kg / hl as was done in hybrid control Rimisol. The analysis of the three hybrids hectolitre mass highlights the achenes have a good filler, which confirms that they have a high degree of adaptation. Elevated hectolitre mass fertilization argue that not only improves yields but also improves its physical characteristics. In relation to agro is found that fertilization significantly influence the value hectolitre mass. Thus the agro N90P60K60 fertilized with foliar fertilizer that N60P60K60 + value hectolitre mass is 40 kg / hl compared with a gain control agro neferilizat 3 kg / hl as statistically significant.

*Table 3*

Hectolitric weight of three sunflower hybrids under fertilization influence at S.D.E Timişoara in the experimental year 2008

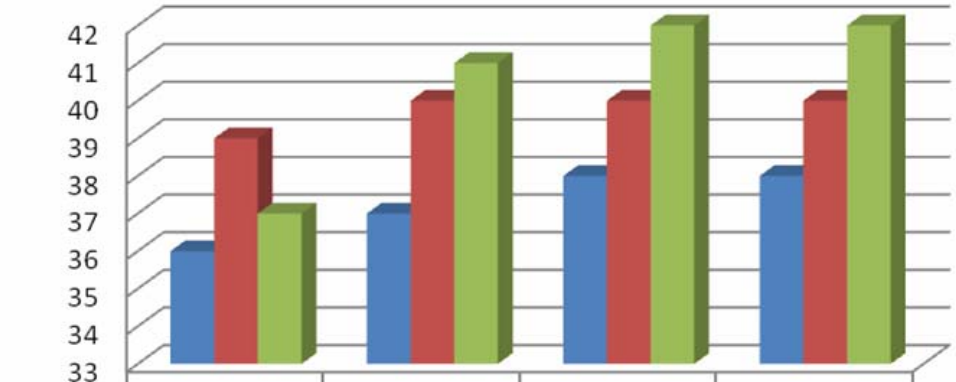
| Factor B (The hybrid) | Factor A – The agro-background | | | | Means of the factor B | | | |
|---|---|---|---|---|---|---|---|---|
| | Unfertilized | N60K60P60 | N90P60K60 | N60P60K60+ Foliar fertilizer | Mean value (kg/hl) | Relative yield (%) | Difference ± related to control (MT) | Signification |
| Rimisol | 36 | 37 | 38 | 38 | 37 | 100 | - | |
| F 30008 | 39 | 40 | 40 | 40 | 40 | 108 | 3 | |
| Hidalgo | 37 | 41 | 42 | 42 | 41 | 111 | 4 | |

DL 5% = 5 kg/ha, DL 1% = 6 kg/ha, DL 0,1 % = 8 kg/ha

| Means of the factor A | | | | |
|---|---|---|---|---|
| Mean value (kg/hl) | 37 | 39 | 40 | 40 |
| Relative yield (%) | 100 | 105 | 108 | 108 |
| Difference ± related to control (MT) | - | 2 | 3 | 3 |
| Signification | | | * | * |

DL 5% = 3 kg/ha, DL 1% = 4 kg/ha, DL 0,1% = 5 kg/ha

It must be remarked that the new hybrids F 30008 and Hidalgo are superior to the control hybrid Rimisol, this fact can be also distinguished in the figure 3.




| | Unfertilized | N60K60P60 | N90P60K60 | N60K60P60 + foliar fertilizer |
|---|---|---|---|---|
| Rimisol | 36 | 37 | 38 | 38 |
| F 30008 | 39 | 40 | 40 | 40 |
| Hidalgo | 37 | 41 | 42 | 42 |

Figure 3. The mean value of the hectolitric weight realized by three sunflower hybrids studied in conditions of Timişoara in 2008 under agro-background influence

**CONCLUSIONS**

The results obtained in the experimental year 2008 allow the establishment of the following conclusions:

1. The three studied hybrids present a very high yield capacity;
2. The existing climatic conditions of the experimental year 2007/2008 did not affect the yield capacity of the studied hybrids;
3. The chemical and foliar fertilizations strongly influence both the plant production and the productivity elements;
4. The equilibrate fertilization with NPK maintains the leaf surface enough large in the phase of flowering – achene formation, so that the achene formation process not be disturbed;
5. The potential of the cultivated hybrids is over 4500 kg/ha which assures an economic efficiency extremely good for sunflower.
6. The physical features MMB and MH are little influenced by the various cultivation conditions and their values are enough large comparing to the climatic conditions of the year, which argue that the studied hybrids have a high adaptation degree to the less favorable conditions for sunflower;
7. The fertilization, in the climatic conditions of 2008, less influences the value of the hectolitric weight, this being in great measure genetically controlled;
8. Analyzing the values of the 1000 grains weight for all three studied hybrids, there was distinguished that the chemical and foliar fertilizations stimulate the values of the 1000 grains weight, determining its increase;
9. In the climatic conditions of the year 2008, the studied hybrids presented a good filling of the achenes.

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